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STEPHEN B. ACKERMAN 28 DAVIS AVENUE POUGHKEEPSIE, NY 12603			EXAMINER HOANG, ANN THI	
			ART UNIT 2836	PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

H/A

**Office Action Summary**

Application No.

10/830,157

Applicant(s)

SIBRAI, ANDREAS

Examiner

Ann T. Hoang

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 is/are allowed.
- 6) ☒ Claim(s) 1-16, 18-20, 22 and 27-32 is/are rejected.
- 7) ☒ Claim(s) 17, 23-26 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/26/04, 5/11/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 820. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities:

On page 1, line 5, the serial number of the related US patent application is 10/828,889.

On page 2, line 11, there appears to be a typo in "Alongside also necessary."

On page 24, line 18, it appears that the current source  $I_1$  should have the numerical reference (320) in order to be consistent with Fig. 1.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 10, 12, 30 and 33 are objected to because the following phrases of the claims render the claims indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention:

In claim 10, the phrase "e.g." used in lines 2 and 3 of the claim.

In claim 12, the phrase "e.g.," used twice in line 3 and once in line 4 of the claim.

In claim 30, the phrase "i.e." used in line 3 of the claim.

In claim 33, the phrases "inter alia" used in line 10 of the claim and "i.e." used in line 70 of the claim.

4. Claims 19-20 and 28-29 are objected to because there is insufficient antecedent basis for the limitation "said switching transistor function" in lines 2-3 of the claims.

5. Claims 22 and 30 are objected to because there is insufficient antecedent basis for the limitation "said driver switch firing" in lines 35 and 51 of claim 22 and line 2 of claim 30.

6. Claim 33 is objected to because the acronym "AVS" in line 19 of the claim should be defined.

Appropriate correction is required.

### ***Double Patenting***

7. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re*

*Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

8. Claims 1-3, 7-15, 18-20, 22, and 27-32 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-4, 6, 9-17, and 19-21, respectively, of copending Application No. 10/828,889. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Regarding claims 1-3, 7, 10-15, and 18-20 of the present application, these claims are identical to claims 1-3, 9, 12-17, and 19-21, respectively, of the copending application.

Regarding claims 8-9 of the present application, the limitation of the current mirror configuration consisting of two FETs, as recited in claim 8 of the present application, falls under the limitation of the current mirror configuration being set up using FETs, as recited in claim 10 of the related application. Claim 9 of the present application is identical to claim 11 of the related application.

Regarding claims 22, 27-29, and 31-32 of the present application, the name "high-side switch in diagnostics mode" in lines 41-42 of claim 22 of the present application is equivalent to the current mirror in line 44 of claim 22 of the copending application and appears to be different in nomenclature only. Accordingly, the High Side Driver circuit block in lines 44 and 48 of claim 22 of the present application is equivalent to the current mirror circuit in lines 46 and 50 of claim 22 of the copending

application and appears to be different in nomenclature only. Claims 27-29 and 31-32 of the present application are identical to claims 27-29 and 31-32, respectively, of the copending application.

Regarding claim 30 of the present application, the HSD controller in line 1 of the claim is equivalent to the controllable current source in lines 1-2 of claim 30 of the copending application and appears to be different in nomenclature only.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 4-5 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 22 and 27-32, respectively, of copending Application No. 10/828,889. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

Regarding claims 4-5 of the present application, the limitation of the means for said high-side switching being realized as a controllable electronic switch, as recited in claim 4 of the present application, falls under the limitation of the means for said high-side switching being realized as a controllable electronic switch in current mirror configuration, as recited in claim 4 of the related application. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a current mirror configuration as the controllable electronic switch in order to maintain a constant current at the output, regardless of loading. Claim 5 of the present application has the equivalent limitation to claim 6 of the related application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-5, 10-14, 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueda et al. (US 5,977,651).

Regarding claim 1, Ueda et al. discloses a circuit, realizing a driver device for secure and reliable firing of an igniter or squib (11), connecting said squib via a high-side electronic switch (15) to a power source (1) and via a low-side electronic switch

(13) to circuit ground, incorporating separate power supply parts for high voltage and low voltage domains and equipped with elaborate intrinsic diagnostic and online testing features for circuit protection and operation securing purposes, comprising:

a means (4) for control of said firing, said diagnostics and said online testing;

a means (15) for said high-side switching of said squib (11) to said power source (1);

a means (13) for said low-side switching of said squib (11) to said circuit ground;

a means (1, 22, 23) for said high voltage domain power supply;

a means (24, 25) for said low voltage domain power supply;

a means (22) for secured supply of electrical energy to said means (15) for said high-side switching derived from said high voltage domain;

a means (14) for secured supply of electrical energy to said means (13) for said low-side switching derived from said low voltage domain;

a means (21) for driving said high-side switching means (15) for said squib (11) controlled by said means (4) for control of firing, diagnostic and online testing and supplying drive current to said high-side switching means (15) either for the case of said diagnostic and online testing operations or for the case of said firing operation; and

a means for connecting said high-side switching means (15) and said low-side switching means (13) to said means (4) for control of firing, diagnostic and online testing in order to execute said diagnostic measurement and online testing whereby in said case of diagnostic and online testing operations a switchable and controllable current flow is initiated in conjunction with appropriate voltage measurements and resistance



evaluations thereby strictly observing that no firing conditions for said squib (11) are allowed to occur and whereby in said case of firing operation a secure firing of said squib (11) is always guaranteed.

See abstract; Fig. 2; column 4, lines 56-60; column 5, lines 35-41; and column 6, lines 8-20. Means (22) for secured supply of electrical energy to said means (15, 19) for high-side switching is included as part of means (1, 22, 23) for said high voltage domain power supply, as is the case in Applicant's disclosure and claim 10. Means (4) for control of firing is a collision detector that outputs a signal to be received by driver circuitry to activate a vehicle passenger air bag. See column 4, lines 21-33. An additional circuit, not shown in Fig. 2, implements the diagnostic and online testing, during which resistors (16, 17) allow a limited current to flow to squib (11) and voltage measurements are taken at various test points within the driver circuitry in order to determine the necessary behavior of the driver circuitry. The current through squib (11) is small enough so that it remains inactive in this phase. See column 4, lines 66-67; column 5, lines 1-8; and column 8, lines 35-47. Said means for connecting is shown in Fig. 2 as wire connections as well as other components of the driver circuitry between means (4) for control of firing and high/low-side switching means (13, 15). It is understood that the diagnostic and online testing circuit would necessarily be connected to switching means (13, 15).

Regarding claim 2, Ueda et al. discloses that said means (15) for high side switching of said squib (11) to said power source (1) connects to one side of said squib (11) and that said means (13) for low-side switching of said squib (11) to said circuit

ground connects to the other side of said squib (11), thus forming a switchable squib firing branch between said power source (1) and circuit ground. See Fig. 2. and column 4, lines 56-60.

Regarding claim 3, Ueda et al. discloses that said means (4) for control of said firing, said diagnostic and said online testing is subdivided into a means (4) for control of said firing and a means for said diagnostic and online testing. The reference discloses means (4) for control of said firing as a collision detector shown in Fig. 2. It is understood that these two means are subdivisions of a combined means for control of said firing, diagnostic and online testing. See column 4, lines 21-33 and 66-67; column 5, lines 1-8; and column 8, lines 35-47.

Regarding claim 4, Ueda et al. discloses that said means (15) for said high-side switching of said squib (11) to said power source (1) is realized as a controllable electronic switch. See Fig. 2 and column 8, lines 1-10 and 50-60.

Regarding claim 5, Ueda et al. discloses that said controllable electronic switch (15) is implemented using a FET. See column 4, lines 49-51.

Regarding claim 10, Ueda et al. discloses that said means (1, 22, 23) for said high voltage domain power supply include generators and batteries (1) from a vehicle as a primary source, and derived there from separate secondary power sources implemented as charge pump devices (22). The reference discloses that driver circuitry for the squib (11) includes a power supply such as a vehicle battery (1) in column 4, lines 8-9, and it is understood that a generator from the vehicle would be included in the embodiment of power supply (1). It is also understood that the charge pump device

(22) is operating in the same voltage range as said primary source (1), since charge pump device (22) is connected to primary source (1) to increase the voltage across primary source (1) for storage in a storage capacitor (2), which acts as a backup for the primary source (1). See Fig. 2 and column 5, lines 49-54.

Regarding claim 11, Ueda et al. discloses that said means (1, 22, 23) for said high voltage domain power supply also includes a controlled current source (23) for said high-side switching device (15). See Fig. 2 and column 5, lines 54-58.

Regarding claim 12, Ueda et al. discloses that said means (24, 25) for said low voltage domain power supply is a separate power source from that of the high voltage domain power supply and shows said means (24, 25) for said low voltage domain power supply as a primary source in the form of a battery (25) in Fig. 2. It is understood that a generator from the vehicle would be included in the embodiment of power supply (24, 25). The reference also discloses that battery (25) of means (24, 25) for said low voltage domain power supply is operating within a reduced low voltage range. See column 8, lines 13-14.

Regarding claim 13, Ueda et al. discloses that said means (24, 25) for low voltage domain power supply also include controlled current sources (24n, 24o) for said low-side switching device. Means (24, 25) for low voltage domain power supply includes an operational amplifier (24), inside of which are controlled current sources (24n, 24o), for feeding a suitable voltage to the control terminal of low-side switching means (13). See Figs. 2 and 4 and column 6, lines 8-9.

Regarding claim 14, Ueda et al. discloses that said means (22) for secured supply of electrical energy to said means (15) for said high-side switching derived from said high voltage domain consists of a charge pump feeding a controlled current source (23). See Fig. 2 and column 5, lines 49-56.

Regarding claim 18, Ueda et al. discloses that said means for connecting said high-side switching means (15) and said low-side switching means (13) to said means (4) for control of firing, diagnostic and online testing comprises, on one hand, output control signal lines leading to said means (21) for driving said high-side switching means (15) and leading to said means (14) for secured supply of electrical energy to said means (13) for said low-side switching derived from said low voltage domain and, on the other hand, input measurement signal lines from said high-side switching means (15) of said squib (11) and from said low-side switching means, as well as power supply and ground connections. See Fig. 2, which shows control signal lines coupled the inputs terminals of means (21) for driving said high-side switching means (15), a control signal line coupled to the control terminal of means (14) for secured supply of electrical energy to said means (13) for said low-side switching, measurement signal lines carrying the source voltages of high-side switching means (15) of said squib (11), and a voltage measurement across a resistor (18) parallel with low-side switching means (13). Also see column 4, lines 21-33; column 5, lines 9-18; and column 7, lines 22-30. As it is shown that means (4) for control of firing outputs a signal into a line connected to the driver circuitry, it is understood that the additional circuit that implements the diagnostic and online testing is necessarily connected to the driver circuitry via signal lines as well.

It is inherent that the means for control of firing, diagnostic and online testing would be connected to a power supply and ground during operation.

Regarding claim 19, Ueda et al. discloses said means (15) for said high-side switching of said squib (11) to said power source (1). Firstly, it is understood that the driver circuitry includes a switching transistor function for controlled firing operation and for onsite test diagnostics, as these would be necessary for collision detector (4) to output signals to be received by the driver circuitry to switch high-side switching means (15), and for the additional onsite test and diagnostics circuitry to implement the diagnostic and online testing, which involves the switching of high-side switching means (15). See column 4, lines 21-33 and 66-67. Secondly, the reference also discloses controlled current source (23) to play a role in driving high-side switching means (15), thus controlling firing operation with current limitation. See Fig. 2. Thirdly, onsite test diagnostics are understood to be included in the additional onsite test and diagnostics circuitry. Thus, the switching transistor function, controlled firing operation with current limitation, and onsite test diagnostics are understood to be included in the operation of the means (15) for high-side switching of squib (11).

Regarding claim 20, Ueda et al. discloses said means (13) for said low-side switching of said squib (11) to said circuit ground. Firstly, it is understood that the driver circuitry includes a switching transistor function for controlled firing operation and for onsite test diagnostics, as these would be necessary for collision detector (4) to output signals to be received by the driver circuitry to switch low-side switching means (13), and for the additional onsite test and diagnostics circuitry to implement the diagnostic

and online testing, which involves the switching of low-side switching means (13). See column 4, lines 21-33 and 66-67. Secondly, the reference also discloses controlled current sources (24n, 24o) to play a role in driving low-side switching means (13), thus controlling firing operation with current limitation. See Figs. 2 and 4. Thirdly, onsite test diagnostics are understood to be included in the additional onsite test and diagnostics circuitry. Thus, the switching transistor function, controlled firing operation with current limitation, and onsite test diagnostics are understood to be included in the operation of means (13) for low-side switching of squib (11).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (US 5,977,651) in view of Zitouni et al. (US 6,787,858). Ueda et al. discloses that said FET (15) is of the NMOS type. See column 4, lines 49-51. The reference does not disclose that FET (15) is manufactured in CMOS technology.

However, Zitouni et al. discloses that integrated circuits supporting CMOS logic and MOSFET transistors used to control operation of an external device are commonly used in automotive applications, including air bag deployments. It would have been obvious to one of ordinary skill in the art at the time of the invention to manufacture the

FET of Ueda et al. in CMOS technology in order to provide the advantages of reduced power consumption, fast switching characteristics, and high density of logic functions per chip associated with CMOS implementation.

15. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda et al. (US 5,977,651) in view of Abe (US 2002/0125950). Ueda et al. discloses that said means (21) for driving said high-side switching means (15) for said squib (11) consists of an integrated High Side Driver (HSD) circuit. Means (21) for driving said high-side switching means (15) is an operational amplifier serving as a current source for said high-side switching device (15). See Figs. 2-3 and column 9, lines 6-24. The reference does not specify that integrated High Side Driver (HSD) circuit (21) is implemented in CMOS technology.

However, Abe discloses a CMOS operational amplifier (10). See Fig. 1. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the CMOS operational amplifier of Abe as the operational amplifier of Ueda et al. for driving the high side switching means in order to provide the advantages of reduced power consumption, fast switching characteristics, and high density of logic functions per chip associated with CMOS implementation.

***Allowable Subject Matter***

16. Claims 17 and 23-26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 17, prior art fails to teach a circuit realizing a driver device for secure and reliable firing of an igniter or squib, comprising an integrated HSD circuit comprising a digital inverter circuit for an input signal fed in from said means for control of firing, diagnostic and online testing, and whereby external connection pins are used for two output connections for internally generated driving and sensing node signals connected to a high-side switching means.

Regarding claims 23-26, prior art fails to teach that the first controllable electronic switch, named high-side switch, is realized by an NMOS-FET switch and driven by the High-Side Driver (HSD) device, in combination with the other limitations recited in the claims.

17. Claim 21 is allowed. The following is an examiner's statement of reasons for allowance:

Regarding claim 21, prior art fails to teach a circuit, included in a driver device for squibs, comprising an output stage configured as a serial circuit of two transistors of PMOS type and an internal current source, and two output terminal pins connected internally to the drains of a first and second FET of said output stage, in combination with the other limitations recited in the claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably



accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

18. Claim 33 would be allowable if rewritten to overcome the claim objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 33, prior art fails to teach a method for controlled operation and secure firing of igniters or squibs, comprising implementation of a low-side switching device with the help of a pair of NMOS transistors in current mirror configuration; implementing for said low-side switching device a current source that defines the normal diagnostic and test operations and the other current source the firing operation; and calculating secure firing current values for said high-side and said low-side switching devices, thus trimming, or setting up said controlled driving currents to their operational necessary minimum, and thus limiting said main supply energy stored within said external storage capacitor to an optimum, in combination with the other limitations recited in the claims.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bennett et al. (US 5,734,317) discloses a MOS driver circuit for firing of a squib having a high-side switch and a low-side switch and a current mirror as a drive limit controller. Fendt et al. (US 6,456,915) discloses a driver circuit for firing of

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an airbag igniter having a high-side switch and a low-side switch and a current mirror as a current measurer. Okamoto (US 5,289,058) discloses an operational amplifier comprising multiple FET transistors of both NMOS and PMOS type and terminal pins for supply voltage, ground, and an external bias voltage. Wiker et al. (US 4,829,899) discloses a CMOS control circuit for firing a squib.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann T. Hoang, whose telephone number is 571-272-2724. The examiner can normally be reached Monday through Friday, 8:00 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached at 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ATH  
2/15/06



**PHUONG T. VU**  
**PRIMARY EXAMINER**